

## **REMARKS**

### **I. Claim Amendment**

Claim 49 and withdrawn Claims 1, 21, 27, 47, 48 and 72 are now amended to more precisely point out the claimed invention.

This amendment is supported throughout the specification. In particular, FIG. 1A depicts reflector M4, which is an “aspherical reflecting surface having portions that correspond to azimuthal angles spanning an azimuthal arc of 360°”, as recited in Claim 49 and withdrawn Claims 1, 21, 27, 47, 48 and 72. Similarly, FIG. 3 depicts reflector M14, which is also an “aspherical reflecting surface having portions that correspond to azimuthal angles spanning an azimuthal arc of 360°”. Further support is found in originally presented Claims 61 and 62, which recite that the “additional reflecting surface can be rotated about at least one axis to effect redirection of one of said object or reference beams through an azimuthal arc of [...] less than or equal to 360° on said ellipsoidal reflecting surface”.

### **II. Summaries of Examiner Interviews**

#### **Summary of Interview with Examiner Bibbins on September 3, 2008**

On March 26, 2009, Applicants submitted a response to the Office Action issued on September 26, 2008. In their response, Applicants inadvertently omitted a summary of the Examiner interview that took place on September 3, 2008. Applicants regret this omission and provide the interview summary below.

A Telephonic Interview took place on September 3, 2008 with Examiner LaTanya Bibbins and Supervisory Patent Examiner Wayne Young, representing USPTO, and Alexander Akhiezer, Ph.D., Timothy J. Meagher, Esq., and inventor Dr. David A. Waldman representing Applicants. The cited references, U.S. 5,566,387 (“Dewald”) and Jang *et al.* “Holographic Data Storage by Combined Use of Peristrophic, Angular, and Spatial Multiplexing”, Opt. Eng. 39(11), pp. 2975-2981 (November 2000) were discussed.

Applicants argued that a *prima facie* case of obviousness was not established because the combination of references does not teach each and every element of the claimed invention and because modification of references as suggested by the Examiner would result in an inoperable

device. Applicants also argued that Jang requires two movable parts and would be inoperable if only one movable part was required.

Applicants further refer to the Interview Summary provided by Examiner Bibbins and dated September 26, 2008.

#### Interview with Supervisory Examiner Young on December 2, 2009

On October 6, 2009, Applicants requested an interview with Examiner Bibbins. Applicants proposed to introduce a claim amendment to address the rejection of Claim 49 based on clarity, under 35 U.S.C. §112, second paragraph. Applicants proposed to amend Claim 49 to address the clarity rejection by an Amendment After Final, thus avoiding filing a Request for Continuing Examination and unnecessarily extending the prosecution of the instant case.

On or about October 27, 2009, Examiner Bibbins indicated that the interview would not be granted.

On October 29, 2009, Applicants placed a phone call to Supervisory Examiner Young to discuss the proposed claim amendment. Applicants made several attempts to contact Supervisory Examiner Young between October 29, 2009 and December 2, 2009.

On December 2, 2009, Alexander Akhiezer (Reg. No. 54,617), representing Applicants, discussed the instant case, by telephone, with Supervisory Examiner Young, representing the USPTO. Examiner Young suggested submitting an Amendment After Final, explaining the difference between the claimed subject matter and the cited references. Examiner Young stated that, in case the Amendment After Final is not entered, the USPTO will issue an advisory action explaining, in detail, substantive reasons for not entering the amendment.

### **III. Office Action of July 20, 2009**

The Office Action of July 20, 2009 stated that Applicants arguments regarding Claims 49, 50, 52-63, 65-67 and 86-88, submitted by an Amendment filed on March 30, 2009 are considered moot in view of new grounds for rejection.

The only new grounds for rejection advanced by the Office Action of July 20, 2009 are under 35 U.S.C. §112, first paragraph (written description) and second paragraph (clarity).

Claim Rejections Under 35 U.S.C. §112

Claim 49 and Claims 50, 52-63, 65-67 and 86-88, dependent on Claim 49, stand rejected under 35 U.S.C. §112, first and second paragraphs. The Examiner objected to the clarity of the phrase “said at least one aspherical reflecting surface spanning an azimuthal arc of 360°” under 35 U.S.C. §112, second paragraph. The rejection under 35 U.S.C. §112, first paragraph (written description) is understood as being necessitated by the clarity rejection.

Applicants have now amended Claim 49 to recite “said at least one aspherical reflecting surface having portions that correspond to azimuthal angles spanning an azimuthal arc of 360°”. Applicants submit that this amendment addresses the Examiner’s objection.

Reconsideration and withdrawal of the rejections under 35 U.S.C. §112, first and second paragraphs, are respectfully requested.

**IV. Office Action of September 26, 2008**Cited References

Examiner Young requested that Applicants argue patentability of the pending claims over the cited references.

Applicants note that the Office Action of September 26, 2008 advanced rejections of the then-pending claims over U.S. 6,700,686 (“King”), over a combination of King in view of U.S. Pat. Pub. No. 2003/0053232 (“Dalziel”), and over a combination of King in view of U.S. 5,566,387 (“Dewald”).

Applicants further note that a prior rejection over Jang *et al.* “Holographic Data Storage by Combined Use of Peristrophic, Angular, and Spatial Multiplexing”, Opt. Eng. 39(11), pp. 2975-2981 (November 2000) (“Jang”), advanced in the Office Action issued on December 19, 2007, and discussed during the Examiner’s Interview on September 3, 2008, has *not* been reproduced in the Office Action of September 26, 2008. Accordingly, it is Applicants’ understanding that the rejection over Jang has been withdrawn.

In view of the foregoing remarks, Applicants recapitulate below their arguments with respect to King, Dalziel and Dewald.

### Claim Rejections

Claims 49, 50, 56, 63, 65-67 and 86 stand rejected under 35 U.S.C. §102(c) as being anticipated by U.S. 6,700,686 ("King"). Claims 52-55 stand rejected as being unpatentable over King in view of U.S. Pat. Pub. No. 2003/0053232 ("Dalziel"). Claims 57-62 stand rejected under 35 U.S.C. §103(a) as being unpatentable over King in view of U.S. 5,566,387 ("Dewald").

Applicants amended base Claim 49 to recite that the at least one aspherical reflecting surface spans an azimuthal arc of 360°. Applicants submit that an apparatus defined by Claim 49 as amended is neither described nor suggested in the references of record.

### Rejection Under 35 U.S.C. §102(c) over King

The elliptical reflecting surface of King is not an "aspherical reflecting surface having portions that correspond to azimuthal angles spanning an azimuthal arc of 360°", as required by Claim 49 as amended. Further, in their review of King, Applicants were unable to find any suggestion to extend mirror 135 (King, FIG. 1) or mirror 288 (King, FIG. 2) to span the full circular arc of 360°. Nor does King describe any advantage for doing so, and does not describe or suggest that more azimuthal angles for multiplexing can be achieved or utilized, with or without combining with planar-angle multiplexing angles, without cross talk by implementing a span of 360°.

Thus, the device defined by Applicants' Claim 49 possesses advantages over King's device. The aspherical reflecting surface can ensure that the reference beam footprint at the media is uniform and permits to change the magnification of the galvanometer-controlled angle to the angle at the holographic media. By virtue of having more azimuthal angles available for the same value of the planar angle, Applicants' device can be used to record *more* azimuthally multiplexed holograms at the same storage location on the recording media.

In view of the foregoing, Claim 49 and claims dependent thereon are novel and non-obvious over King. Reconsideration and withdrawal of the rejection are respectfully requested.

### Rejection Under 35 U.S.C. §103(a)

In rejecting dependent Claims 52-55 and, separately, dependent Claims 57-62, the Examiner relied on Dalziel and Dewald. The Examiner relies on Dalziel for its teachings of a

galvanometer device. The Examiner relies on Dewald for its teachings of angle-multiplexed holography.

As Applicants previously explained, Dalziel is devoid of any reference to holography, much less to a combination of azimuthal and plane angle multiplexing. Dalziel describes a two-dimensional galvanometer that "uses the Z-stop mechanism to substantially confine the movement of the mirror or the mirror assembly to rotation around one or more rotational axes without any significant translational movement". See Dalziel, [0023], FIG. 1, and [0024]. Dalziel does not provide motivation to modify a holographic recording/reading device of King to include an aspherical reflecting surface having portions that correspond to azimuthal angles spanning an azimuthal arc of 360°, as required by Claim 49.

As Applicants also previously explained, Dewald discloses an apparatus for recording/reading holographically stored information in which holograms may be planar angle multiplexed. See Dewald, brief description of FIG. 5 and column 11, lines 8-12. Planar angle multiplexing is accomplished by rotating mirror 70 shown in FIG. 2 around a single axis that is perpendicular to the plane of the drawing and by reflecting the light beams off of aspherical mirror 76. See Dewald, column 6, line 5. As a consequence, Dewald's device is used solely for planar angle multiplexing. Dewald is devoid of teachings or suggestion of azimuthal multiplexing, and, therefore, of a combination of azimuthal and planar multiplexing. Dewald fails to disclose that either mirror 70 or mirror 76 of Dewald's FIG. 2 can rotate around two axes, a feature that permits combined multiplexing. Because Dewald does not teach azimuthal multiplexing, Dewald's aspherical mirror 76 spans only a fraction of an azimuthal arc. Thus, Dewald does not provide motivation to modify the device of King to include an aspherical reflecting surface having portions that correspond to azimuthal angles spanning an azimuthal arc of 360°, as required by Claim 49.

In view of the foregoing, Claim 49 and claims dependent thereon are non-obvious over the combination of King, Dalziel and Dewald. Reconsideration and withdrawal of the rejections are respectfully requested.

**CONCLUSION**

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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